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ABSTRACT

Phase II of a feasibility study to gather information for implementing telecommunications into the office systems and technologies curriculum at Jefferson College began in January 1984. The objectives were to provide the instructional staff with the technical information needed to teach telecommunications and to explore the possibility of establishing a telecommunications network for community colleges in the Midwest. The business community served as the resource for information on telecommunications technology. Researchers visited companies involved in telecommunications and talked with telecommunications personnel from other companies to gather the general information. Several companies provided equipment demonstrations and copies of manuals. Discussion with MCI representatives and use of MCI Mail on a daily basis showed that the procedure for implementing a college telecommunications network could be accomplished at a relatively low cost for each participating school. (Attachments include a description of procedures, delivery and rates of telecommunications services, and a bibliography.) (YLB)

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FINAL REPORT

PHASE II FEASIBILITY STUDY TO GATHER INFORMATION FOR IMPLEMENTING TELECOMMUNICATIONS INTO OFFICE TECHNOLOGY CURRICULUM

Project No. 84-131/132-600-2(145-145)C

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June 30, 1984

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ABSTRACT

The second phase of the feasibility study to gather information for implementing telecommunications into the Office Systems and Technologies curriculum at Jefferson College began in January, 1984. The objectives were to provide the instructional staff with the technical information needed to teach telecommunications and to explore the possibility of establishing a telecommunications network for community colleges in the Midwest.

The highlight of this study took place when two representatives from MCI presented a demonstration of electronic mail and allowed the researchers to send and receive electronic messages on a "make-shift" equipment installation at Jefferson College. A more sophisticated setup using a 3M Whisper Writer and modem was installed on a trial basis on April 2. With this equipment and MCI telephone lines, both instructors and students were able to send and receive electronic messages routinely on a daily basis for the remainder of the semester.

As a result of the findings of this study, plans have been initiated to add communications capabilities to the word processing shared system which is presently being used. This will allow electronic transmissions to and from eight terminals via MCI telephone lines. After this system has been installed and is working properly, the researchers will be better able to help implement a network for community colleges.

The State Supervisor of Business and Office Education and personnel from other colleges have been approached with the network idea. Their reactions have been positive, and the objective appears to be attainable. Recommendations are that educational leaders in the State become involved to recognize the need for telecommunications study and to support this goal.

Statement of Problem

This is the second part of a two-phase study to gather information for implementing telecommunications into the Office Systems and Technologies curriculum at Jefferson College. The first phase of this study, which was conducted from July to December, 1983, surveyed St. Louis business firms to determine requisite skills and concepts needed for entry-level positions in offices utilizing telecommunications technology. The results of the first phase provided the data needed to incorporate telecommunications as an integrated part of information processing studies at Jefferson College.

Telecommunications is the electronic transfer of data from one machine to another. This is not a new concept; it is now an essential link in many business offices with most word processing equipment installations now including telecommunications among their capabilities. Telecommunications has been called the fastest growing sector of the service-related industry.

A major problem businesses encounter in using this technology is the lack of trained personnel. "One of the main stumbling blocks that must be overcome to ensure the successful use of this technology is the scarcity of trained telecommunications professionals."[1]

The three major information management technologies, voice communications, data processing, and word processing, are no longer separate and distinct units. These technologies overlap and integrate into one information processing system. ". . . the hallmark of the office of

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[1]"Principles of Telecommunications Management," Datapro Reports on Telecommunications, Datapro Research Corp., Delran, NJ, March, 1983, p. 101.

information processing system. ". . . the hallmark of the office of the future is integration: combining in one system the three previously distinct technologies of information management."[2]

As telecommunications becomes a major part of the information processing system, vocational business and office programs must incorporate this technology into the curriculum. Vocational students seeking employment upon completion of their studies will need telecommunications skills for entry-level positions. Vocational educators working with the business community can best provide the educational programs on emerging technologies. This two-phase study was conducted to make vocational education more readily serve the purpose for which it is intended.

Statement of Objectives

The goal of the second phase of this study was to provide the instructional staff with the technical information needed to teach telecommunications as an integral part of the curriculum. The objectives of this phase were to:

1. Provide the instructional staff with the background information to successfully provide students with telecommunications skills needed for employment in the automated office.

As there are no teacher education courses which provide information on telecommunications technology, the business community served as the resource for this objective. Several key firms which were identified

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[2]Steve Lail, "Integrating Office Technology is the Key to Surviving Deregulation," St. Louis Manager, Admore Publishing Co., St. Louis, May, 1984, p. 25.

as leaders in the use of telecommunications provided the general information, equipment demonstrations, and manuals which served as primary resource data.

The researchers visited companies involved in telecommunications and talked with telecommunications personnel from other companies to gather the general information to complete this objective. Several companies provided equipment demonstrations and copies of telecommunications procedures for additional input. The diversity of experiences gained from the different companies provided excellent background information. The equipment provided by MCI allowed instructors and students to actively participate in data communications.

The researchers conclude that the objective to gain background information needed to teach telecommunications was a success.

2. The second objective of this study was to explore the possibilities for establishing a network for a college telecommunications system.

There are some existing networks today which link several colleges and businesses for the purpose of teaching telecommunications. Others are in the planning stages. After talking with MCI representatives and using MCI Mail on a daily basis, it was determined that the procedure for implementing a college network could be accomplished at a relatively low cost for each participating school. The researchers discussed the possibility of such a network with state supervisors in Missouri and Kansas and with faculty members from several colleges in Missouri. All were enthusiastic about receiving more information and were willing to participate in further discussions to explore the possibilities of establishing a Midwestern network.

It is recommended that continued study be devoted to the possibilities for implementing an educational community college network.

Population and Sample

The survey form used to gather information for Phase I of this study identified companies involved in telecommunications. Item 23 of the survey instrument used in Phase I determined companies willing to serve in an advisory capacity to further the study in telecommunications. These companies provided the contacts to gather the data for Phase II of this study.

The business firms participating in this phase of the study provided a good general background for telecommunications. See Attachment B Reference Number B-1 for a list of participating companies. These companies differed in the types of information they provided. Four companies provided copies of procedures manuals, several provided demonstrations with some use of equipment by researchers, and several telecommunications specialists spent time talking about telecommunications applications. All participating companies contributed some valuable information toward the objective of this phase of the study.

Seminars presenting information on telecommunications included Local Area Networks--Current Status and Outlook, presented by Brian R. Blackmarr, P.E., C.M.C., of Dallas, Texas, and Electronic Communications and the Automated Office presented by Stephen Elliot of Arthur Andersen, Inc.

The NBEA National Convention held in Chicago had several sessions dealing with telecommunications, and the Metro St. Louis Business Associations Business Fair provided the opportunity to visit with telecommunications specialists and to view the latest in telecommunications equipment.

Findings from each resource company, person, or meeting were combined to provide the total background information for this study.

Conclusions and Recommendations

The researchers had visualized being able to gain some experience using telecommunications equipment by visiting companies in the St. Louis area. The installation of MCI equipment on campus for routine use by far surpassed any expectations. Not only did the instructors get first-hand experience, but all students in the information processing concepts classes were able to send and receive electronic messages.

If requisitions for equipment purchases proceed as planned, the Jefferson College information processing program will include telecommunications as a part of its regular curriculum in the 1984-85 school year. This should provide the working experience needed to proceed with plans for establishing a community college network. If this objective is to be fully realized, it is recommended that:

(1) As the Jefferson program progresses, a delivery system be devised for sharing the information with possible networkers.

(2) State Department personnel and community college administrators become involved to give support to the plan.

(3) Community college and State Department uses of a network be explored. A more detailed study of the network in operation in Alaska could provide valuable input for this recommendation.

(4) Instructors of business and office programs be provided in-service workshops to gain information needed for teaching telecommunications and to determine how telecommunications could work for their programs.

(5) The State Department of Education become involved to get Missouri on an educational network.

Disclaimer

The activity which is the subject of this report was supported in whole or in part by funds from the Department of Elementary and Secondary Education, Division of Career and Adult Education. However, the opinions expressed herein do not necessarily reflect the position or policies of the Missouri Department of Elementary and Secondary Education or the Division of Career and Adult Education, and no official endorsement should be inferred.

ATTACHMENTS

ATTACHMENT A

PROCEDURES

During Phase I of this study, the investigators established business contacts for obtaining telecommunications background information. These contacts consisted of respondents of the survey instrument who had indicated on the survey form a willingness to serve in an advisory capacity. The researchers visited offices; held informal interviews; read current literature; participated in equipment demonstrations; contacted publishing companies and vendors; and attended meetings, machines shows, and seminars. Each source contributed valuable input. Efforts were made to contact personnel in schools where telecommunications networks have been established; no response was received from these inquiries.

The real turning point in this phase of the study happened on March 14 when two representatives from MCI visited the Jefferson College campus to provide an equipment demonstration on MCI electronic mail. In addition to literature and video displays, they set up a "make-shift" connection through a combination of different telephones, a modem, and a small typewriter-like component and made connections through telephone lines with MCI in Chicago. The two instructors involved in this study were able to send and receive electronic messages using this "make-shift" hookup. This was their first real experience in using electronic communications, although telecommunications personnel had guided the researchers through very simple applications.

This demonstration was so successful that MCI representatives returned to the campus on April 2 and set up a more sophisticated hookup

which they left for instructors to use on a regular basis. This procedure was accomplished by using a 3-M Whisper Writer, a modem, and MCI telephone lines. After instructors became acquainted with this equipment, demonstrations were set up for students enrolled in the word processing concepts classes. This coincided with the presentations on electronic distribution--many of the instructional materials had been gathered during the first phase of this study. By the third week in April, word processing students were sending and receiving electronic messages on a regular basis as a routine part of classroom assignments.

MCI Mail can reach every postal address in the United States, including Alaska and Hawaii, through one of four different classes of service. Via Western Union International, an operational company of MCI, MCI Mail can interface to all of the 1.6 million telex machines abroad.

The fastest delivery method is MCI Instant Mail, which enables a user to transmit documents composed on a personal computer, word processor, electronic typewriter, or data terminal. A local or 800 telephone number is dialed--the demonstration hookup used an 800 number in Chicago--to connect the sending terminal--in this case a 3M Whisper Writer--to MCI's computer. The sender then types in name and password (which must be used to access the service), then sends the message. The message can go to another subscriber's terminal--his "electronic mailbox"--via the MCI network and can be delivered within seconds anywhere in the country.

If the recipient of the document is not a subscriber of MCI Mail, the message can be delivered by any of three other methods. The sender accesses MCI service and composes the message in the same way he/she uses Instant Mail; but instead of going to an electronic mailbox, the document is printed and sent by one of the other types of MCI service. One such

option is Four-Hour Delivery Service. The document is sent to an MCI Postal Center in one of 15 major metropolitan areas. (See Attachment B Reference B-2.) There it is laser printed and hand delivered within four hours after transmission. Frequent users can register letterhead and signatures at MCI Postal Center headquarters and can have original-quality, signed letters delivered. This service is available for a small annual fee for all MCI options except Instant Delivery. (See Attachment B Reference B-3.) The other two delivery options are Overnight Delivery and MCI Letter Delivery Services. MCI Overnight Mail guarantees delivery before noon the following day in over 20,000 cities. MCI uses the delivery services of Purolator Courier Corporation to guarantee Four-Hour and Overnight Delivery. An MCI Letter, the fourth delivery option, is transmitted to the MCI Postal Center nearest the recipient, laser printed, and placed in the U.S. Mail for delivery--generally the next day.

There is no minimum annual fee or hookup fee for a registered user; the subscriber pays only when a document is sent. An electronic message of up to 7,500 characters (one MCI ounce) costs $1 to send. Paper copies of up to three pages sent by Four-Hour Delivery are $25; by Overnight Delivery, $6; and by MCI Letter, $2. (See Attachment B Reference B-3.)

MCI Mail enables most makes and models of digital-based equipment to communicate with no loss of function--the sender can store, edit, and retrieve transmitted documents. The MCI switching center translates a message from one digital-based language into the digital language of the receiving equipment. A message sent on a Lanier or Xerox word processor can be received by a Wang word processor, a mainframe or personal computer terminal, or an electronic typewriter, and vice versa.

The instructors routinely communicated electronic messages with MCI offices in Chicago. Students, however, sent electronic messages which

were printed and delivered the next day by U.S. mail. After area high school business teachers were identified, a letter was composed to explain to the recipient that the letter was being sent as a class project for students to gain experience sending electronic messages and to keep area teachers informed about the curriculum at the College. A copy of the message and a list of teachers who were sent messages is supplied in the appendix of this report. (See Attachment B References B-4 and B-5.)

Having access to MCI Communications for instructors to use and for instructional purposes provided the experiences which were needed to complete the first objective of this phase of the study.

The second objective was to explore the possibility of establishing a telecommunications network among community colleges in the Midwest. Several such networks are in operation throughout the U.S. Current literature and an understanding of electronic data communications support the possible Midwest community college network idea. Many people, however, would need to give support and become involved to establish an effective education network. A delivery system would need to be devised and goals and uses for such a network defined. The following review of networks in operation can provide awareness and incentive for further study.

A pilot telecommunications network of five California schools and one each in New Jersey, Wisconsin, and Indiana was established in 1981. The researchers sent letters to Saddleback College in California and Ball State University in Indiana asking for information regarding this network but received no reply from either inquiry. According to an article published about this network, ". . . students learn the real advantages of automated technology when they can transmit data, revise, and re-transmit

at remarkable speed. Students come to grips with the 1980's knowing that the functions they will manage depend, to a great extent, on office automation and their own success directly depends on their willingness and ability to use it."[3] Students learn to send and receive from machine to machine and also to combine data from various sources to create finished documents.

The telecommunications curriculum established at Saddleback College focused on two basic areas. First, it concentrated on the various techniques for sending, receiving, revising, and re-sending single and multiple documents. Second, it emphasized the interface of computer and word processing equipment to input and retrieve data by keying into a computer data base, to retrieve and integrate information from a data base into documents, and to input information from a word processor to a computer.

Several goals have emerged from the pilot network. One of them is to provide students with relevant training so students can transmit documents. Another goal is to provide a support network for business educators to enable schools implementing telecommunications to share teaching materials and teaching techniques and to encourage rapport between business and education.

Temple University in Philadelphia has set in motion a plan to procure a new state-of-the-art telecommunications system supporting voice, video, and data applications. "A primary goal of this strategic plan is to provide every faculty member, student, and most administrators with appropriate access to computing capability where they study and/or work. To reach this goal, the university is in the process of providing for an integrated network of micro, mini, and mainframe computers whereby each

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[3]Arntson, Joyce, "A Tele-Curriculum," Words, August-September, 1981, pp. 16-19.

classroom and office of the university will contain a network access port handling voice and data transmission, and selected classrooms and conference rooms will contain two-way access to the video transmission system."[4]

Temple has carefully developed this network and equipment plan as a response to the "probable impact of current and emerging technology on Temple's role in preparing graduates for today's high-tech job market. . . ."[5] The people responsible for Temple's plan recognize that the U.S. is becoming an information-based economy, and computer/communications technology is central to this ongoing evolution. There is a comparable demand for information technicians and managers as well as for workers who are literate and comfortable with text and data processing, data base management, and electronic communication systems.

According to Dr. Scanlon, the author of this article, and two telecommunications personnel from Anheuser-Busch, a by-product of current trends is the emergence of personal computers and executive workstations. These management personnel will now have more responsibility for their own data processing and data base management, and a knowledge of telecommunications functions and applications will be of vital importance if these managers are to use the equipment for maximum productivity and effectiveness.

Another interesting educational aspect for computer telecommunications is being implemented by the New Haven Public School System in Connecticut with assistance from Southern New England Telephone (SNET).

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[4]Scanlon, Robert Jr. (Dr.) and John K. Patterson, "Temple University and a Telecommunications Procurement Program," T.H.E. Journal, April, 1984, pp. 79-81.

[5]Ibid.

The program, called Learning Link, will use a telephone network to connect computers in different schools and with computer databanks. "The primary goals of this three-year project are to help stimulate student interest in learning critical skills and to explore ways that computers can be used to enhance communications."[6] "The educated people of tomorrow must know how to use the computer to get answers from other people through a broad range of information networks."[7] This year Learning Link will connect classroom computers inside each school with one another, with computers at the other schools on the network, and with an outside educational database. Plans are to expand Learning Link to include other New Haven schools during the next two years.

According to a Jefferson College administrator, a network linking community colleges and State Department of Education offices is currently operating in the state of Alaska. However, the researchers were not able to get details of how it was organized.

The researchers contacted two publishing companies and received copies of the table of contents of two forthcoming books on telecommunications. They met with the authors of one of these books at the NBEA Convention in Chicago and discussed the applications of telecommunications in the college curriculum. Publishing companies are aware of the impact this technology will have on vocational educators, and several books will be on the market within the next two years. This will be important to schools which are planning to integrate telecommunications into the existing curriculum or for those adding a telecommunications course.

The researchers also discussed the procedures necessary for establishing a network with Charles Newman, Missouri State Supervisor for

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[6]"Computer Network Established for New Haven Schools," Modern Office Technology, April, 1984, p. 46.

[7]Ibid.

Business and Office Education, and Sue Owens, Kansas State Supervisor in Business and Office Education. They also approached several instructors from other community colleges to determine whether there would be enough interest to start a network. The response was enthusiastic.

The researchers are convinced that, in view of the minimal cost of sending and receiving messages and the fact that most schools already have equipment which could be used as communicating terminals, a Midwest college network could be put in operation before the end of the 1984-85 school year.

ATTACHMENT B

REFERENCES

B-1 Business Resources

1. Anheuser-Busch
2. Bobbs-Merrill Educational Publishing
3. Bryan, Cave, McPheeters & McRoberts
4. First Chicago Bank
5. Gregg Division, McGraw-Hill Book Company
6. Edward D. Jones
7. Lanier Business Products
8. MCI
9. McDonnell Douglas Office Automation Company
10. Mobil Oil Corporation, Dallas, Texas
11. Ralston Purina Company
12. Rolm Corporation

ATTACHMENT B

REFERENCE B-2

MCI MAIL POSTAL CENTERS

ATLANTA, GA
BOSTON, MA
CHICAGO, IL
CLEVELAND, OH
DALLAS, TX
DETROIT, MI
HOUSTON, TX
LOS ANGELES, CA
NEW YORK CITY, NY
MINNEAPOLIS, MN
PHILADELPHIA, PA
PITTSBURGH, PA
SAN FRANCISCO, CA
ST. LOUIS, MO
WASHINGTON, DC

ATTACHMENT B

REFERENCE B-3

DELIVERY AND RATES

	First MCI Ounce	Additional MCI Ounce
Instant Delivery: Delivery from Terminal to Terminal via MCI's Electronic Mailbox.	$ 1.00	$ 1.00
Four-Hour Delivery: Paper-Copy, Guaranteed Delivery by Courier anywhere within the metropolitan areas of 15 major cities.	$25.00	$ 1.00
Overnight Delivery: Paper-Copy, Guaranteed (By Noon) Delivery by Courier in 20,000 continental U.S. cities.	$ 6.00	$ 1.00
MCI Letter Delivery: Paper-Copy, Transmitted to nearest MCI Postal Center and then delivered to U.S. Postal Service for local delivery.	$ 2.00	$ 1.00

*An MCI Ounce is 7500 characters for electronic delivery, or three pages for paper delivery.

SERVICES

Personalized Stationery: (Letterhead and Signature)	$20.00 Per Year
Basic Service:	No Monthly Charge
Business Service: (see below)	$10.00 Per Month
Dow Jones Information:	Dow Jones Rates

ATTACHMENT B

REFERENCE B-4

TELECOMMUNICATIONS GRANT

The attached letter was sent to the following high school teachers between April 2 and May 3, 1984.

High School	Teacher
Festus	Mrs. Willa McCullough
Fox	Mrs. Glenda Waldrop
Fox	Mrs. Gwen Morris
DeSoto	Ms. Kathy Roth
Ste. Genevieve	Mr. Robert Pingel
St. Pius	Ms. Robin Mooneyham
Northwest	Mrs. Linda Tabor
Fox	Mrs. Mary Guffy
Herculaneum	Mrs. Jane Franklin
Hillsboro	Mrs. Terry Barton
Crystal City	Mrs. Pauline Gruber
Windsor	Ms. Judith Hanners
Bishop DuBorg	Mrs. Delpha Linderer
Kennedy	Mrs. Trudy Minana
Hayti	Ms. Dianne Myracle

MCI
Digital Information
Services Corporation
2000 M Street, NW
Suite 300
Washington, DC 20036
202 293 4255

MCI

ATTACHMENT B

REFERENCE B-5

April 11, 1984

Mrs. Terry Barton
Hillsboro High School
Hillsboro, MO 63050

(COURTESY COPY)

Dear Mrs. Barton:

This message is coming to you and your students via MCI Mail from the word processing center at Jefferson College. As part of a class project, we are sending electronic messages to you and other high school teachers.

Two of our instructors, Linda Henson and Myrna Sanders, have been doing research funded by the Missouri Research Coordinating Unit. During the course of their study, they contacted representatives from MCI Communications who helped them establish electronic mail on a trial basis. We are using a 3M Whisper Writer which has a keyboard and a printer and is connected to a telephone by modem.

Jefferson College hopes to implement the study of Telecommunications into the Office Systems and Technology curriculum next year using the Lanier Shared System as communicating terminals. We, as students in the word processing center, are sending this message to you to gain experience in using electronic mail and to keep you informed about the word processing curriculum at Jefferson College.

Sincerely,

Beth Vreeland
Tracy Smoot

ATTACHMENT C

BIBLIOGRAPHY

Books

Datapro Reports on Telecommunications, Volume I. Delran, New Jersey: Datapro Research Corporation. 1983.

Periodicals

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